

Remarks

Claims 1-6, 16, 17, and 22-42 are pending in this application. Claims 1, 4, 16-17, 22 and 24 have been amended as shown above. New claims 26-38 have been added.

35 U.S.C. 102(b):**Claim 24:**

The Examiner has rejected claim 24 under 35 U.S.C. §102(b) as being allegedly unpatentable over WO 94/08907 (Szemler).

Applicant respectfully traverses the Examiner's §102(b) rejection. Applicant maintains that presently pending claim 24 is not anticipated by Szemler.

Currently amended claim 24 recites:

A process for converting organic materials into a gaseous fuel, said process comprising anaerobically digesting organic materials in the presence of an intermittently applied electrical potential to produce carbon dioxide and a gaseous fuel comprising a mixture of hydrogen and methane.

Szemler does not disclose, teach or suggest, *inter alia*, a process for producing a “gaseous fuel comprising hydrogen, methane and mixtures thereof.” However, to speed prosecution and to correct a typographical error in the previous amendment to claim 24, applicants have hereinabove amended claim 24 to recite, in relevant part “a gaseous fuel comprising a mixture of hydrogen and methane.”

In order to establish anticipation by a reference, that reference must describe each and every limitation of the claim. While Szemler generally describes a method for improving the production of methane (CH₄), nowhere does Szemler describe a process for producing a “gaseous fuel comprising a mixture of hydrogen and methane” as in claim 24. In fact, all of Szemler's examples describe a biogas composed of CO₂ and CH₄ only. The Examiner correctly notes the above, stating that the process of Szemler produces carbon dioxide and methane.

Applicant respectfully maintains that claim 24, which reads in relevant part “to produce carbon dioxide and gaseous fuel comprising a mixture of hydrogen and methane,” does not claim the production of carbon dioxide and methane alone.

35 U.S.C. 103(a):

Claims 1-6, 16-17, 22-23 and 25:

The Examiner has rejected claims 1-6, 16-17, 22-23 and 25 under 35 U.S.C. §103(a) as being allegedly unpatentable over Szemler, in view of U.S. Patent No. 4,200,505 (Day).

Applicant respectfully traverses the Examiner’s §103(a) rejection. Applicant maintains that presently pending claims 1-6, 16-17, 22-23 and 25 are not rendered obvious by Szemler and Day, either alone or in combination.

In order to establish a *prima facie* case of obviousness the cited references must disclose, teach or suggest all of the claim elements, there must be a reasonable expectation of success in the combination and there must be some suggestion or motivation to modify the reference or combine reference teachings. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991); MPEP §§ 2142 and 2143. Applicant respectfully submits that a *prima facie* case of obviousness cannot be established since none of these conditions have been met.

Claims 1 and 16

Currently amended claim 1 recites:

A process for producing hydrogen from anaerobically digested organic materials comprising applying an intermittent electric potential across said materials to produce hydrogen and carbon dioxide.

Currently amended claim 16 recites:

A process for producing hydrogen from anaerobically digested organic materials comprising applying an intermittent electric potential across said materials to produce hydrogen and carbon dioxide wherein the amount of time required to reduce the amount of said organic materials is substantially reduced compared to the time required without application of said electric potential.

The Szemler reference, alone or in combination with Day, does not disclose, teach or suggest, *inter alia*, the application of an electric potential across anaerobically digested organic materials to produce hydrogen and carbon dioxide whereby the electric potential is applied occasionally after periods without application of the electric potential.

Szemler merely describes the well known fact that some hydrogen is naturally formed during facultatively anaerobic conditions and that this hydrogen serves as a substrate for methane producing microorganisms. Further, Szemler merely describes the production of methane by using electricity to intensify fermentation, while Day merely describes the electrolytic conversion of animal wastes into animal feed (proteins) in the presence of aerobic bacteria, where electrolytic conditions are controlled to promote aerobic bacterial growth. Furthermore the electrical current applied in Day is applied continuously. See Day at col. 3 lns 2-23, col. 4 lns 37-53. Nowhere does Szemler, alone or in combination with Day, disclose, teach or suggest that an occasionally applied electric potential can be used to produce hydrogen.

Thus, Szemler, alone or in combination with Day, fails to disclose, teach or suggest, *inter alia*, the application of an electric potential across anaerobically digested organic materials to produce hydrogen and carbon dioxide whereby the electric potential is applied occasionally after periods without application of the electric potential.

Furthermore one of ordinary skill would not have expected that hydrogen could be produced by applying an intermittent electrical potential to anaerobically digested organic

wastes, given that Szemler describes the use of an electrical potential to intensify fermentation in order to produce methane, thus teaching away from the production of hydrogen.

Claim 17

Currently amended claim 17 recites:

A process for conversion of biomass wastes into useful energy comprising applying an intermittent voltage to depress microorganismal activity that produces methane, enhance production of hydrogen, or create an atmosphere within said biomass wastes rich in hydrogen.

Szemler, alone or in combination with Day, does not disclose, teach or suggest, *inter alia*, application of intermittent voltage for purposes selected from the group including depression of microorganismal activity that produces methane, enhancement of microorganismal activity that produces hydrogen, and creation of an atmosphere within said biomass wastes that is maintained rich in hydrogen.

Applicant respectfully maintains that claim 17 is not obvious over Szemler, alone or in combination with Day, at least for the above-mentioned reasons and the reasons relating to claims 1 and 16 described above. In addition, Szemler, with its description of enhanced methane production, directly teaches away from applicant's claimed invention, one of the purposes of which is to depress the production of methane.

Moreover, it is clear from the specification of Day that the hydrogen by-product formed in Day's process is not the result of the application of intermittent voltage to biomass wastes for purposes including depression of microorganismal activity that produces methane, enhancement of microorganismal activity that produces hydrogen, and creation of an atmosphere within said biomass wastes that is maintained rich in hydrogen. See Day at col. 4 lns 37-57 – col. 5 lns 1-11.

Thus, Szemler, alone or in combination with Day, do not disclose, teach or suggest, *inter alia*, a process for conversion of biomass wastes into useful energy comprising the steps of: application of intermittent voltage for purposes selected from the group including depression of microorganismal activity that produces methane, enhancement of microorganismal activity that produces hydrogen, and creation of an atmosphere within said biomass wastes that is maintained rich in hydrogen.

Claim 23

Applicants have herein-above canceled claim 23 because, due to a typographical error, claim 23 was duplicative of claim 1. Thus the Examiner's rejection of claim 23 is rendered moot.

Claims 2-6, 22 and 25

Dependent claims 2-6 depend from independent claim 1, and dependent claims 22 and 25 depend from independent claim 17 and therefore derive their patentable distinctiveness in part from their respective independent claim. For the reasons mentioned above, applicants respectfully maintain that dependent claims 2-6, 22 and 25 are not obvious over Szemler, alone or in combination with Day.

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In view of the foregoing, applicant respectfully requests that the Examiner reconsider and withdraw the rejections set forth in the November 26, 2005 Office Action and allow the presently pending claims, namely claims 1-6, 16-17, 22, and 25 and amended claim 24.

No fee, other than the fee for a three-month extension of time, is believed to be necessary in connection with the filing of this Response. However, if any additional fee is

necessary, applicant hereby authorizes such fee to be charged to Deposit Account No. 50-0540.

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